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COMPARATIVE DEVELOPMENT OF THE NEMERTEANS, WITH NOTES ON THE EARLY STAGE

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In each summer of the years from 1950 to 1957 the mature nemerteans commonly found at Akkeshi were kept in shallow finger bowls for observing the habit of spawning and development. The nemerteans used are *Tubulanus punctatus*, *Procephalothrix simulus*, and *Cephalothrix* sp. of the order Paleonemertea, *Lineus torquatus*, *L. alborostratus*, and *Micrura akkeshiensis* of the order Heteronemertea, and *Emplectonema gracile* and *Oerstedia dorsalis* of the order Hoplonemertea. The larva of *Tubulanus punctatus* is elliptic in shape and provided with an apical tuft. The larva of *Procephalothrix simulus* is elliptic in shape and provided with an apical and a caudal tufts and two pairs of lateral tufts. The larva of *Cephalothrix* sp. is elliptic in shape and provided with an apical and a caudal tufts and a pair of lateral tufts. The larvae of *Lineus torquatus* and *L. alborostratus* show the pilidium type of development. The larva of *Micrura akkeshiensis* is elliptic in shape and provided with an apical tuft, and the metamorphosed young worm creeps out from the posterior end of the larva. As in the pilidium and Desor larva the adult ectoderm is derived from the five amniotic invaginations of the larval ectoderm. The larva is an type intermediate between the pilidium and Desor larva. The larva of *Emplectonema gracile* is elliptic in shape and provided with an apical and a caudal tufts. As in the Desor larva the young worm of *Oerstedia dorsalis* escapes from the egg membrane surrounding.

Comparing the development of the present species with that of the other one described it is concluded that the types of nemertean development of the external features are not useful for the classification into four orders, namely Paleonemertea, Heteronemertea, Hoplonemertea, and Bdellonemertea.

In *Micrura akkeshiensis* and *Emplectonema gracile* the egg is surrounded by a glutinous membrane, and the egg membrane is spontaneously raised irrespective of whether the egg is inseminated. The glutinous membrane of *Micrura akkeshiensis* is broken before the egg membrane is raised. In *Cephalothrix* sp. and *Oerstedia dorsalis* an egg mass from which the future young larvae or worms creep out, is formed by the glutinous substance. As in *Cerebratulus lacteus* the protuberance of the egg is present in the eggs of *Micrura akkeshiensis* and *Lineus*

torquatus.

The eggs of the present species show a spiral type of cleavage. In the eight-cell stage four micromeres are budded off dexiotropically from four macromeres, and the former is larger than the latter. These characters of development are recognized in *Tubulanus punctatus*, *Procephalothrix simulus*, *Lineus torquatus*, *Micrura akkeshiensis*, *Empletonema gracile*, and *Oerstedia dorsalis*. The cleavage at the 16-cell stage occurs laeotropically. The 28-cell stage at which four micromeres (2a–2d) remain undivided, is found in *Lineus torquatus*.